

Pycnodithella harveyi, a new Australian Species of the Tridenchthoniidae (Pseudoscorpionida: Arachnida)

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A new species of the genus *Pycnodithella* Beier, *P. harveyi* is described from the Sydney region. It is only the second known species of the genus and is characterized by its relatively small size and a distinctly reticulated carapace.

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INTRODUCTION

The family Tridenchthoniidae Balzan 1891 is at present represented by 16 genera including approximately 70 species. Of these, only two species namely: *Anaulacodithella australica* Beier and *Heterolophus australicus* Beier, have been described from Australia, the remainder are mostly confined to SE Asia and Africa. The species described herein is only the second known species of the genus *Pycnodithella* Beier and its first Australian representative.

Measurements are based on the examination of 10 specimens of each stage made in accordance with those discussed in Chamberlin (1931). Those in parentheses are the female and follow those of the male.

Abbreviations for cheliceral trichobothria and setal formulae follow those devised by Chamberlin (1931). All specimens are preserved in spirit.

SYSTEMATIC DESCRIPTION

TRIDENCHTHONIIDAE Balzan 1891

Remarks: Chamberlin and Chamberlin (1945) state that the name Dithidae, which has been used by various authors, is a synonym of the Tridenchthoniidae.

1947 *Pycnodithella* Beier

Type species: *Pycnodithella abyssinica* (Beier) 1944

Emended diagnosis: Dorsum of chelal hand without transverse furrow; fixed chelal finger with 8 trichobothria, *et* near *ds*, distinctly separated from *it/est*; movable chelal finger with acute teeth extending to finger base; intercoxal tubercle absent.

Remarks: The genus *Pycnodithella* was erected by Beier (1947: 287) solely on the basis of the position of the trichobothria *et* in relation to the double setae *ds*. The discovery of a new species, here assigned to *Pycnodithella* has therefore necessitated the emended diagnosis for the genus.

Pycnodithella differs from *Verrucadithella* Beier 1931 in that the dorsum of the chelal hand does not possess a transverse groove.

Anaulacodithella (Beier) 1944 is distinguished from *Pycnodithella* in that the trichobothria *et*, *it* and *est* of the fixed chelal finger are grouped together, distinctly separate from the double setae *ds* and that the teeth of the movable chelal finger, proximal to the trichobothria *st*, are replaced by a wavy lamella extending to the finger base.

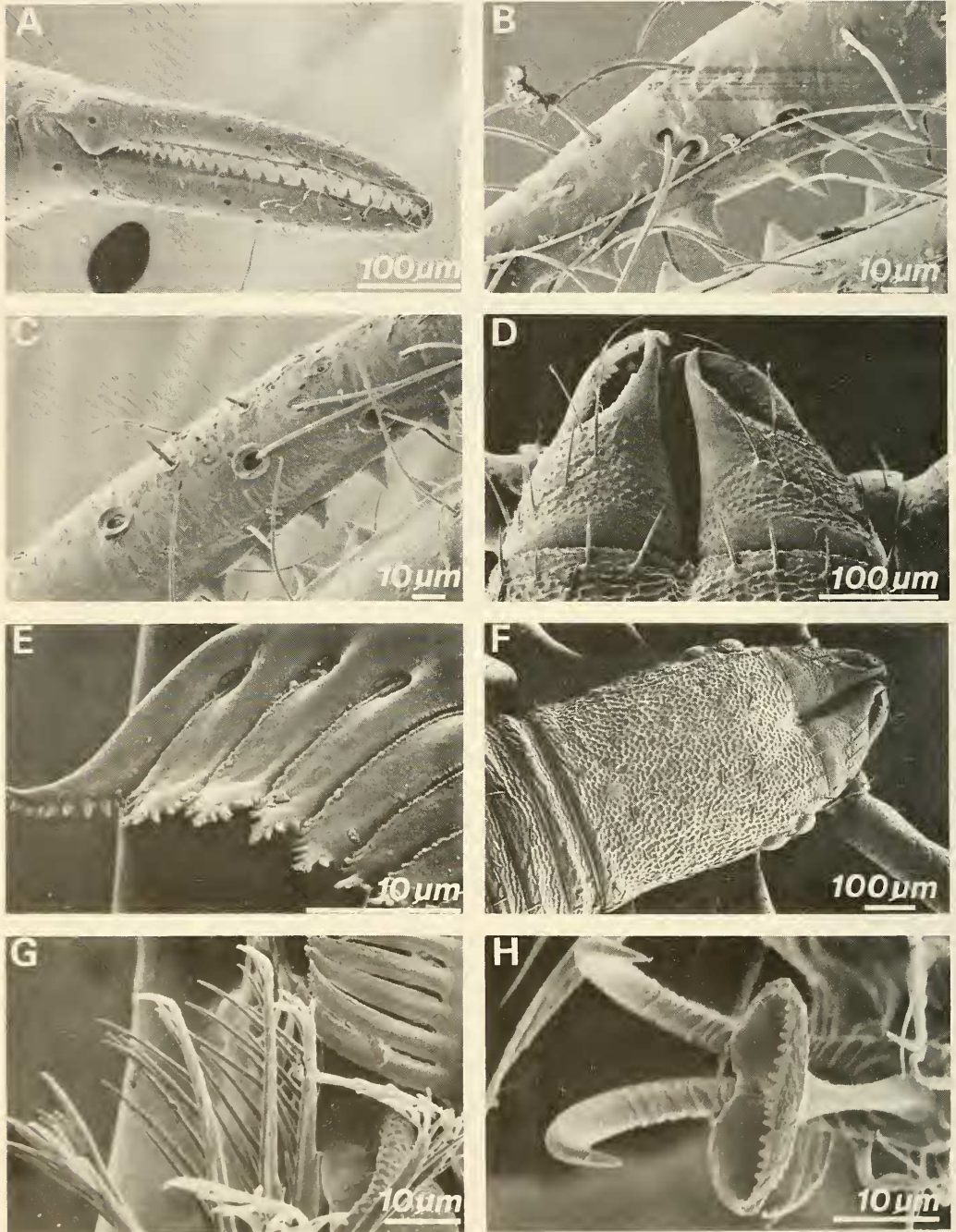


Fig. 1. Scanning electron micrographs. *Pycnodithella harveyi* n. sp., male paratype: A, lateral aspect of left chela; B, fixed chelal finger showing trichobothria *et* near *ds*; C, movable chelal finger showing trichobothria *t*, *st* and *sb* equidistant; D, chelicerae, dorsal aspect; E, distal lamellae of serrula exterior; F, Carapace showing conspicuous reticulate sculpture and well developed eyes; G, unilateral pinnate blades of flagellum; H, pretarsus.

Pycnodithella harveyi sp. nov.
(Fig. 1, Fig. 2, Fig. 3, Fig. 4)

Etymology: This species is named in honour of Dr M. S. Harvey in recognition of the great contribution he has made to the knowledge of the Pseudoscorpion fauna in Australia.

Holotype: ♂, Australian Museum, Sydney (KS 17441).

Type locality: Macquarie University campus, North Ryde, 13.5km NW of Sydney G.P.O., N.S.W.; 33°47'S, 151°07'E, in litter, 17.vi.85, C. Kennedy.

Paratypes: same data as holotype, Australian Museum, 6♂ (KS 17442), 6♀ (KS 17443), 6 nymphs (KS 17444). Distribution to various other museums in progress.

Diagnosis: Trichobothria *t*, *st* and *sb* equidistant (Fig. 1C); fixed chelal finger with 20-22, movable chelal finger with 16-18 acute, well-spaced teeth. Carapace conspicuously reticulate; chela (with pedicel) 0.59-0.64 (♂), 0.64-0.73 (♀) mm in length, 4.20-5.08 (♂) 4.0-4.70 (♀) x longer than broad; 1st and 2nd pedal coxae each with 4 medial coxal spines.

Description: Adults. Colour dark brown; pleural membrane cream, smooth; dorsal surface of cephalothorax with conspicuous reticulate sculpture extending to cornea of eyes and tergites (Fig. 1F), fields of reticulation deeply depressed on carapace, somewhat shallow on tergites. Pedipalpal trochanter with gently rounded anterior margin, L/W ratio 1.10-1.71 (♂), 1.20-1.80 (♀), femur straight increasing in width distally 3.02-2.50 (♂), 3.83-4.80 (♀), tibia pyriform, curved towards tibio-femoral insertion, 1.90-2.30 (♂), 1.75-2.25 (♀); chela distally setose, very slightly papillate dorsally, smooth ventrally with 20-30 short, acuminate setae, chela (with small pedicel) 4.21-5.08 (♂), 4.05-4.71 (♀), chela (without pedicel) 4.0-4.90 (♂), 3.52-4.50 (♀) x longer than broad. Fixed finger with 8 trichobothria, *et* near *ds* and distinctly separate from *it/est* (Fig. 1B), movable finger with 4 trichobothria (Fig. 1A), marginal teeth acute, distinctly separated on both fingers, progressively smaller proximally, never contiguous, 20-22 fixed finger, 16-18 movable finger (Fig. 3R); 2 minute teeth at base of terminal teeth precede marginal rows. Chelicerae large, stout, fixed finger dorsally papillate except distally, broad smooth band along posterior margin, 6-8 setae, *ls* absent, 10 minute antrorse teeth, first large; movable finger slender, galeal seta anterior to 7-8 marginal teeth, terminal tooth large, erect, others progressively very small and antrorse, galea absent. (Fig. 1D). Serrula exterior with 16-17 (♂), 15-16 (♀) lamellae (Fig. 1E); serrula interior with 8-10 thick, blunt lamellae, serrate margin. Flagellum with 8-10 slender, unilaterally pinnate blades of sub-equal length, distally divided into 3-4 short spines that are bent at an obtuse angle with respect to the blades and are directed towards the midline; 6-7 long 'spines' well-spaced along the upper two thirds of the blades point in the same direction (Fig. 1G); base of blades stalk-like. Carapace (Fig. 1F) anterior margin serrate, median blunt vestigial epistome (Fig. 3P); setae spine-like 8:8-10:50-60 (♂), 8:8-10:40-50 (♀); two well-developed eyes; L/W ratio 1.0-1.16 (♂), 0.77-1.0 (♀) x longer than broad. Tergal chaetotaxy: ♂ 12-14: 12-14: 14-16: 15-16: 15-16: 16-18: 15-16: 10-12: 10: 8-10: 2; ♀ 12-14: 12-14: 12-14: 14-16: 14-16: 14-16: 13-16: 12-15: 13-14: 10-12: 10: 2, uniseriate. Coxae: 1st pedal coxae with anterior mesial process; 1st and 2nd pedal coxae each with 4 short medial coxal spines transversely incised into finger-like projections distally (Fig. 2I, J), base of spine thick; intercoxal tubercle absent. Coxal chaetotaxy: ♂ 2: 4-5: 6-8, 0:6-8:4, 0: 6-8: 4-5, 0: 6-8: 7-10, 0: 6-8: 8-11; ♀ 2: 6: 5-6, 0: 4-6: 4-6, 0: 4-6: 4-8, 0: 4-6: 8, 0: 4-6: 10-12, 8-10 long acuminate setae on posterior border. Male genitalia: consisting of complex series of sclerotized apodemes and rods, dorsal anterior apodeme appears brush-like; ejaculatory canal atrium cup-shaped and anterior to genital armature (Fig. 4V). Fig. 4T shows the three dimensional structure of the genitalia. Chaetotaxy: ♂

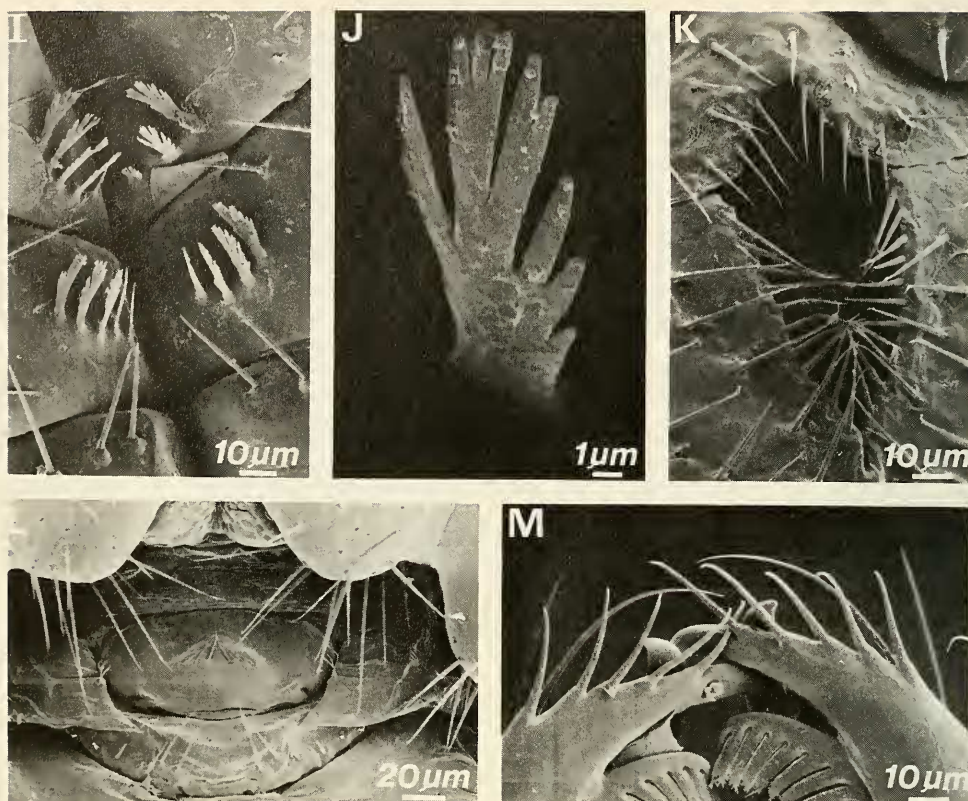


Fig. 2. *Pycnodithella harveyi* n. sp. I, male-coxal spines; J, enlargement of distal portion of one coxal apine; K, male genital region, external aspect; L, female genital region, external aspect; M, tritonymph showing multiple simple galeae.

genital plate medially in the form of a diamond; anterior operculum with 5 marginal, long acuminate setae each side projecting into open cavity, posteriorly a row of shorter setae running parallel to the former; posterior operculum: 11 marginal acuminate setae each side, closely spaced, projecting into lower part of cavity and converging centrally to enclose cavity in kind of grill, posteriorly, a row of widely-spaced setae extending beyond operculum margin; posterior to the former a row of 4 shorter setae behind which is one very long seta (Fig. 2K). Female genitalia: strongly sclerotic with pronounced thickenings; thin irregularly-shaped transverse median cribriform plate; numerous minute platelets scattered within sclerotization; spiracles obliquely situated with well defined stigmatic plates (3 setae each) and characteristic for family (Fig. 4W) spermathecae absent. Chaetotaxy: anterior operculum with 6-8 centrally located setae converging to form a pyramid; posterior operculum with 15-17 very short setae on posterior border (Fig. 2L). Sternal chaetotaxy ♂ 4-8 weakly divided, 0:18-20: 23-25: 12-14: 18-20: 16-20: 16-18: 14-16: 14-16: 12-14: 10-12: 2, sternites 4-12 uniseriate; ♀ 4-8 weakly divided, 0: 16-18: 12-14: 8-10: 14-16: 12-16: 14-16: 14-18: 14-15: 12-14: 10-12: 2, sternites 3-12 uniseriate. Pretarsus: claws obliquely ridged, curving over a trumpet-shaped arolium with delicate serrate rim (Fig. 1H). Heterotarsate. Dimensions (mm): body length 1.1-1.16 (1.18-1.51); pedipalps: trochanter 0.14-0.16/0.09-0.10 (0.12-0.18/0.09-0.12), femur 0.37-0.45/0.09-0.12 (0.41-0.52/0.10-0.12), tibia 0.19-0.27/0.10-0.12 (0.21-0.27/0.10-0.12), chela (with

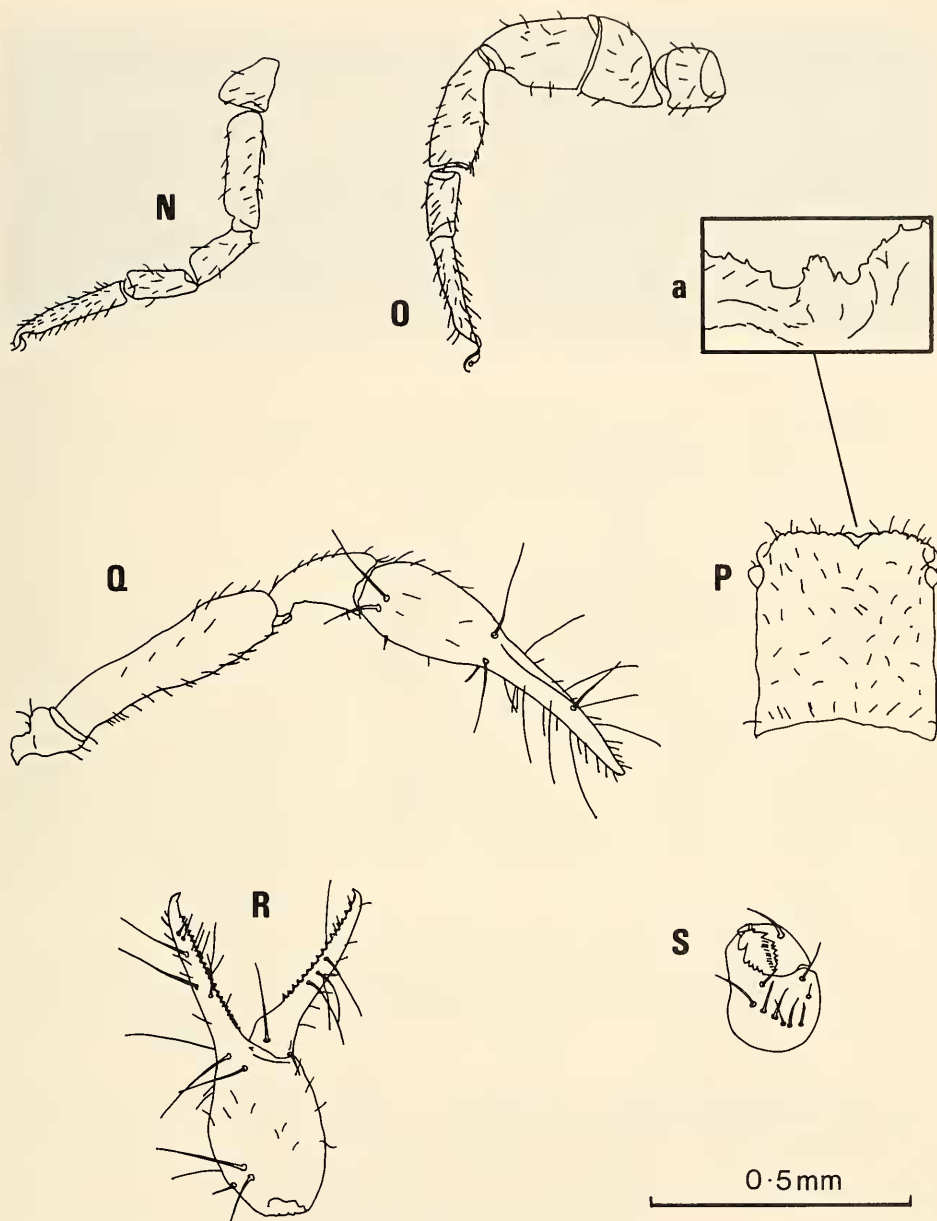


Fig. 3. *Pycnodithella harveyi* n. sp., male paratype: **N**, leg I; **O**, leg IV; **P**, carapace, dorsal aspect — inset **a**, epistome not clearly defined in light microscopy) traced from scanning electron micrograph $\times 1700$; **Q**, left pedipalp, dorsal aspect; **R**, right chela, lateral aspect; **S**, right chelicera, dorsal aspect.

pedicel) 0.59-0.64/0.12-0.15 (0.64-0.73/0.14-0.18), chela (without pedicel) 0.55-0.60/0.12-0.15 (0.60-0.70/0.14-0.18), movable finger length 0.30-0.36 (0.36-0.43); chelicera 0.19-0.25/0.10-0.12 (0.18-0.27/0.12-0.16), movable finger length 0.12-0.14 (0.14-0.18); carapace 0.36-0.43/0.34-0.39 (0.37-0.47/0.39-0.48); anterior eye 0.052-0.054 (0.052-0.056), posterior eye 0.046-0.048 (0.048-0.05); leg I: coxa width 0.09-0.14 (0.09-0.14), trochanter

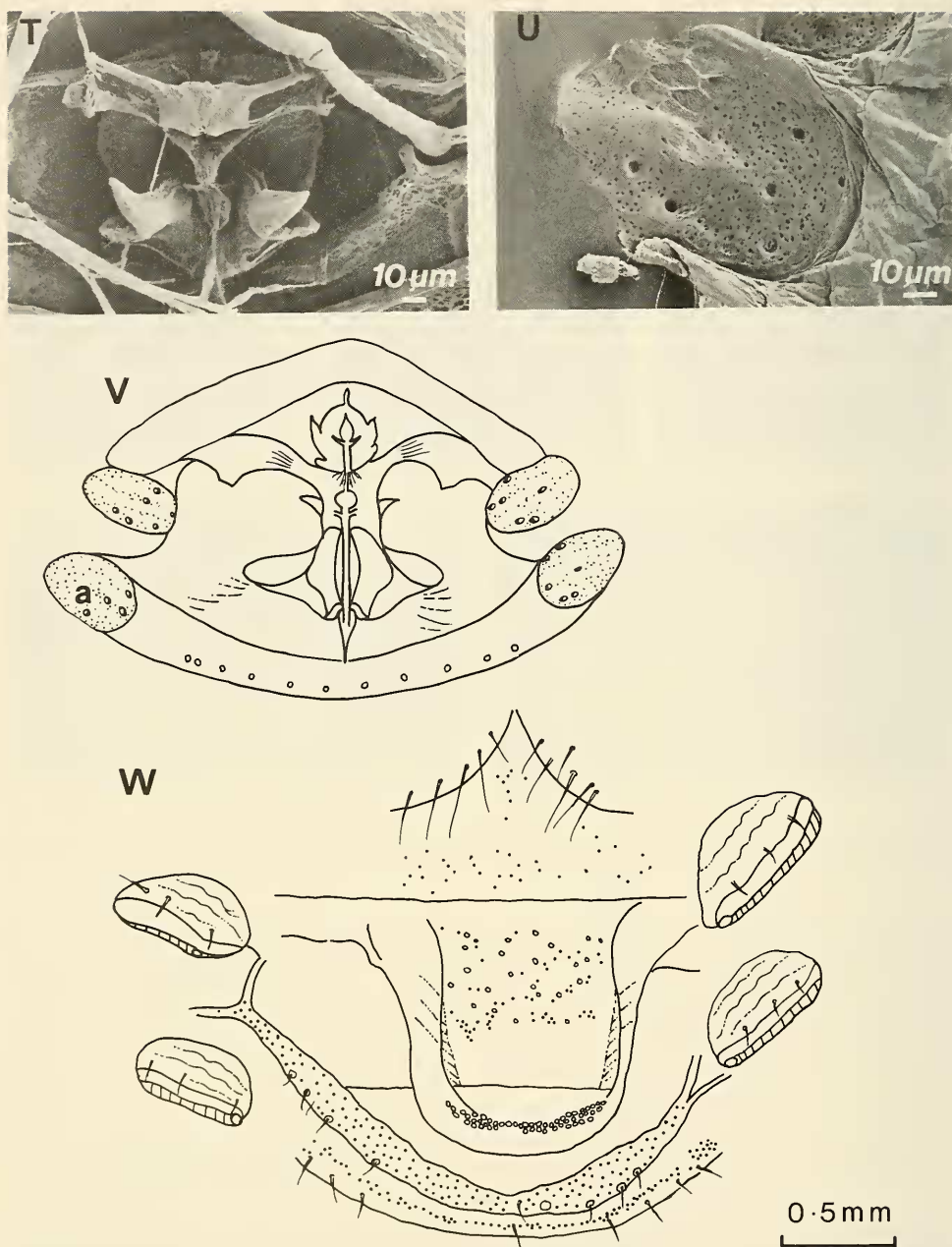


Fig. 4. *Pycnodithella harveyi* n. sp., paratypes: T, male genitalia, ventral aspect; U, sclerotic, perforated plate designated a in V. V male genitalia and associated sternites; W, female genitalia and associated sternites.

0.09-0.12/0.07-0.10 (0.10-0.18/0.09-0.10), basifemur 0.18-0.23/0.03-0.05 (0.10-0.27/0.03-0.05), telofemur 0.10-0.18/0.03-0.05 (0.10-0.18/0.03-0.05), tibia 0.09-0.14/0.03-0.04 (0.10-0.16/0.03-0.05), miotarsus 0.16-0.21/0.03 (0.12-0.19/0.02-0.03); leg IV: coxa width

0.09-0.10 (0.10-0.12), trochanter 0.10-0.16/0.09-0.11 (0.15-0.91/0.09-0.12), basifemur 0.16-0.18/0.07-0.12 (0.12-0.27/0.09-0.12), telofemur 0.18-0.21/0.07-0.09 (0.18-0.21/0.07-0.12), tibia 0.16-0.21/0.06-0.08 (0.12-0.27/0.07-0.09), metatarsus 0.09-0.14/0.03-0.05 (0.12-0.15/0.03-0.05), telotarsus 0.18-0.21/0.03-0.04 (0.18/0.21/0.03).

Tritonymphs. Pedipalpal trochanter 1.0-1.70, femur 3.10-4.57, tibia 1.33-1.80, chela (with pedicel) 3.50-4.60, chela (without pedicel) 3.25-4.10 x longer than broad. Fixed finger with 7 trichobothria, *isb* absent, movable finger with 3 trichobothria, *b* absent. Chelicera with 5 simple galea (Fig. 2M), serrula exterior of chelicera with 13-14 lamellae. Carapace with 4: 10: 25-35 setae; 0.82-1.0 x longer than broad. Tergal chaetotaxy: 10-12: 10-12: 10-12: 8-10: 8-10: 8-10: 8-10: 8-10: 8-10: 4-6: 2. Sternal chaetotaxy: 8-10: 8-10: 8: 7-8: 8: 8-10: 8-10: 8-10: 7-8: 5-8: 2-3: 2. Coxal chaetotaxy: 1st pedal coxae with mesial process, 1st and 2nd coxae each with 4 medial coxal spines, 0: 4-5: 3, 0: 4-5: 3, 0: 4-5: 7, 0: 6-8: 7-8.

Dimensions (mm): body length 0.90-0.99; pedipalps: trochanter 0.10-0.14/0.07-0.09, femur 0.27-0.36/0.07-0.09, tibia 0.12-0.18/0.09-0.10, chela (with pedicel) 0.41-0.52/0.1-0.14, chela (without pedicel) 0.39-0.50/0.10-0.14, movable chelal finger 0.21-0.32; carapace 0.30-0.36/0.32-0.39.

Deutonymphs. Pedipalpal trochanter 1.0-1.28, femur 2.57-3.85, tibia 1.28-1.77, chela (with pedicel) 4.0-4.55, chela (without pedicel) 3.90-4.55 x longer than broad. Fixed finger with 6 trichobothria *ist* and *isb* absent, movable finger with 2 trichobothria, *sb* and *b* absent. Chelicerae with 4 simple galea. Serrula exterior with 11-12 lamellae. Carapace 3: 8: 20-30 setae, 0.87-0.10 x longer than broad. Tergal chaetotaxy: 8-10: 6-8: 6-8: 8-10: 8-10: 6-8: 5-7: 5-8: 4-5: 4-5: 3-4: 2. Sternal chaetotaxy: 1-2: 1-2: 5-6: 5-6: 5-6: 5-6: 5-6: 4-5: 4-5: 3-4: 2. Coxal chaetotaxy: 1st pedal coxae with mesial process. 1st and 2nd pedal coxae each with 4 short medial coxal spines, 0: 2-4: 1, 0: 3-4: 2, 0: 2-4: 2, 0: 2-4: 3.

Dimensions (mm): body length 0.70-0.73. Pedipalps: trochanter 0.07-0.09/0.06-0.08, femur 0.18/0.27/0.07-0.08, tibia 0.09-0.16/0.07-0.09, chela (with pedicel) 0.37-0.43/0.09-0.10, chela (without pedicel) 0.36-0.41/0.09-0.10, movable finger length 0.19-0.25; carapace 0.23-0.30/0.25-0.32.

Protonymphs. Present indications suggest there is no free living protonymph stage. The question as to whether the embryonic protonymph stage follows a pattern of development similar to that of *Chthonius tetrachelatus* Preyssler (Weygoldt, 1968a,b), or if indeed this stage is suppressed in the Australian species, is at present under investigation.

Comparisons: *P. harveyi* n. sp. differs from *P. abyssinica* (Beier) 1947 in the sculpture of the carapace which is conspicuously reticulate in contrast to the finely granulated type species. The trichobothria *t*, *st*, *sb* in the new species are equidistant (Fig. 1C), as compared with the situation in *P. abyssinica* where *st* of the movable chelal finger is clearly nearer *sb* than *t*. The new Australian species is also distinctly smaller in most respects than *P. abyssinica* and has fewer teeth in both chelal fingers.

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